

TORTRICOIDEA OVERVIEW

- General Background
- Classification and phylogeny
- Identification – field and lab
- Immature stages – morphology
- Pest Species
- Some common Arizona species



General Background

- Single family Tortricidae



Olethreutidae



Tortricidae



Cochylidae

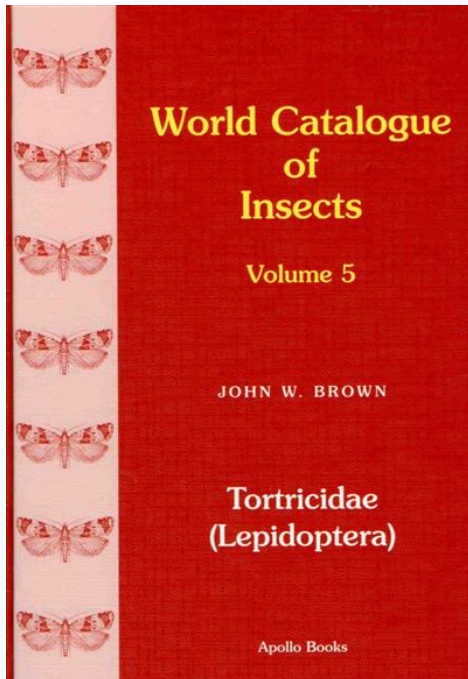
General Background

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- Common name – leaf-rollers or bell moths



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- About 11,000 described species



T@RTS
Online World Catalogue of the Tortricidae

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General Background

Diurnal Species



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- Single family Tortricidae
- Common names – leaf-rollers or bell moths
- About 11,000 described species
- Worldwide in distribution with greatest species richness in the Neotropics
- Mostly small to tiny nocturnal moths (forewing length 5-10 mm), but a few very large, colorful diurnal species
- Larvae mostly phytophagous leaf-rollers, but diverse feeding modes and hosts

General Background

Feeding strategies

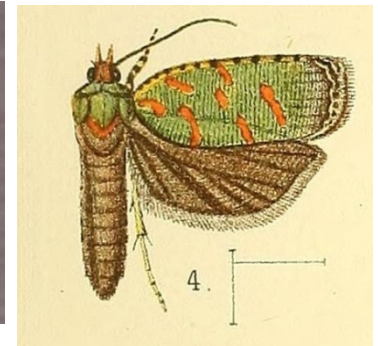
Bactra – feed on semi-aquatic monocots – *Cyperus*, *Typha*



Andrioplecta – feed in galls of Cynipidae



Russograptis – predaceous on scale insects



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- Larvae mostly phytophagous leaf-rollers, but diverse feeding modes
- Third most important superfamily in terms of pest species

Lots o' pests



*Cydia
pomona*



*Thaumatotibia
leucotreata*



*Choristoneura
rosaceana*



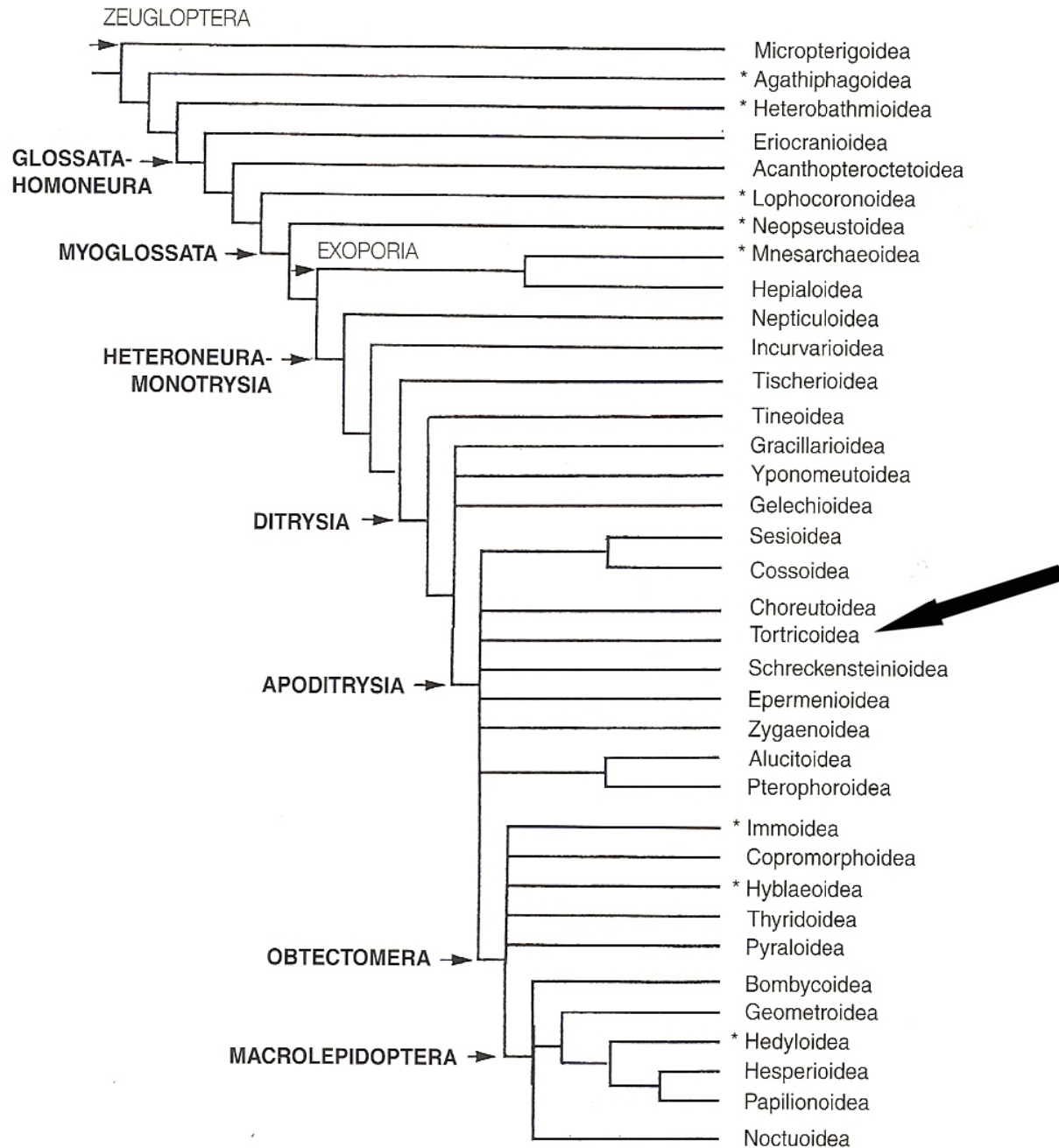
*Epiphyas
postvittana*



*Amorbia
cuneana*



*Platynota
stultana*



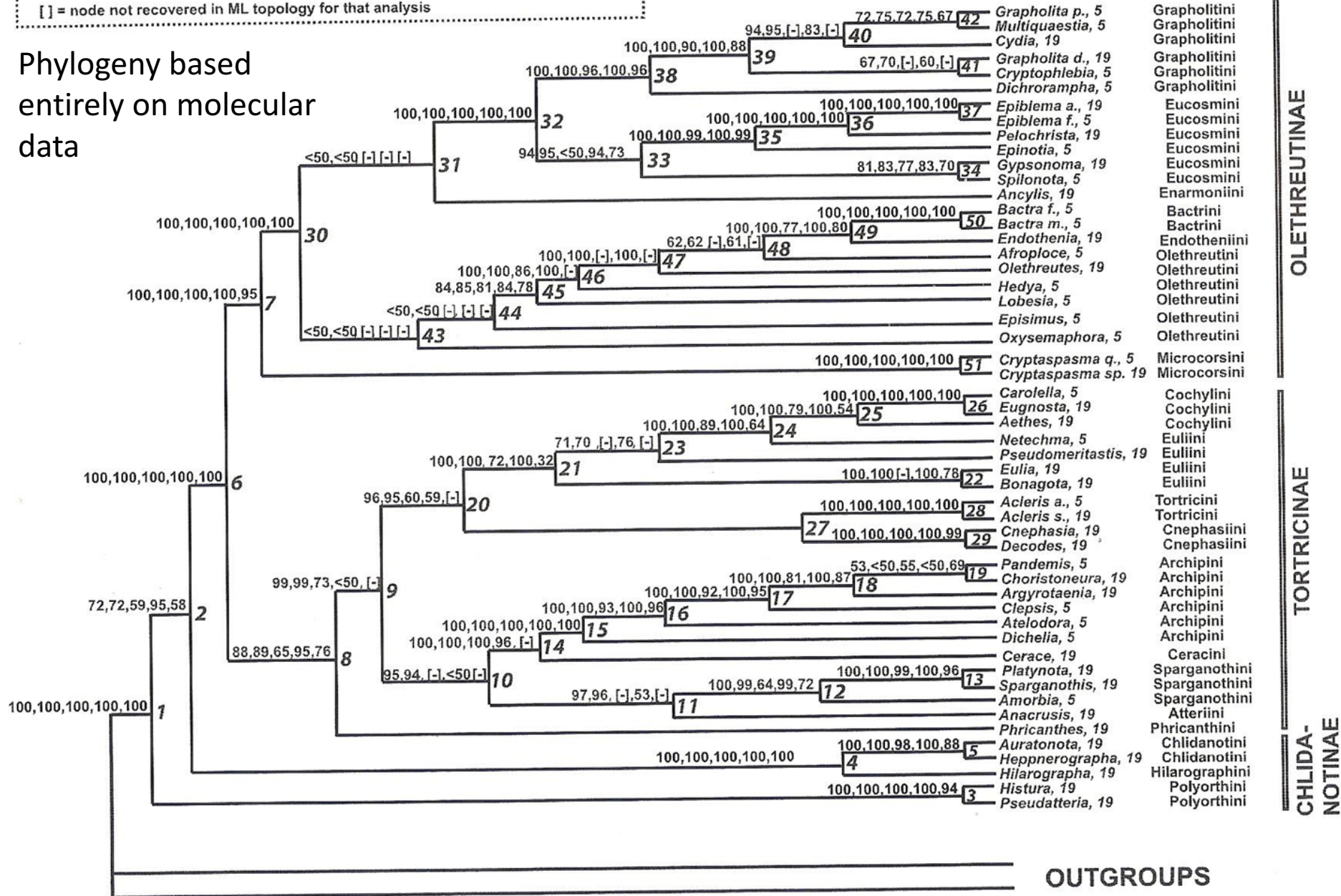
Topology displayed: best ML tree for nt123 (19 gn)

Bootstraps, above branches:

nt 123 (19 gn), nt123_partitioned (19 gn), degen 1 (19 gn), nt123 (5 gn), degen1(5 gn)

[] = node not recovered in ML topology for that analysis

Phylogeny based entirely on molecular data



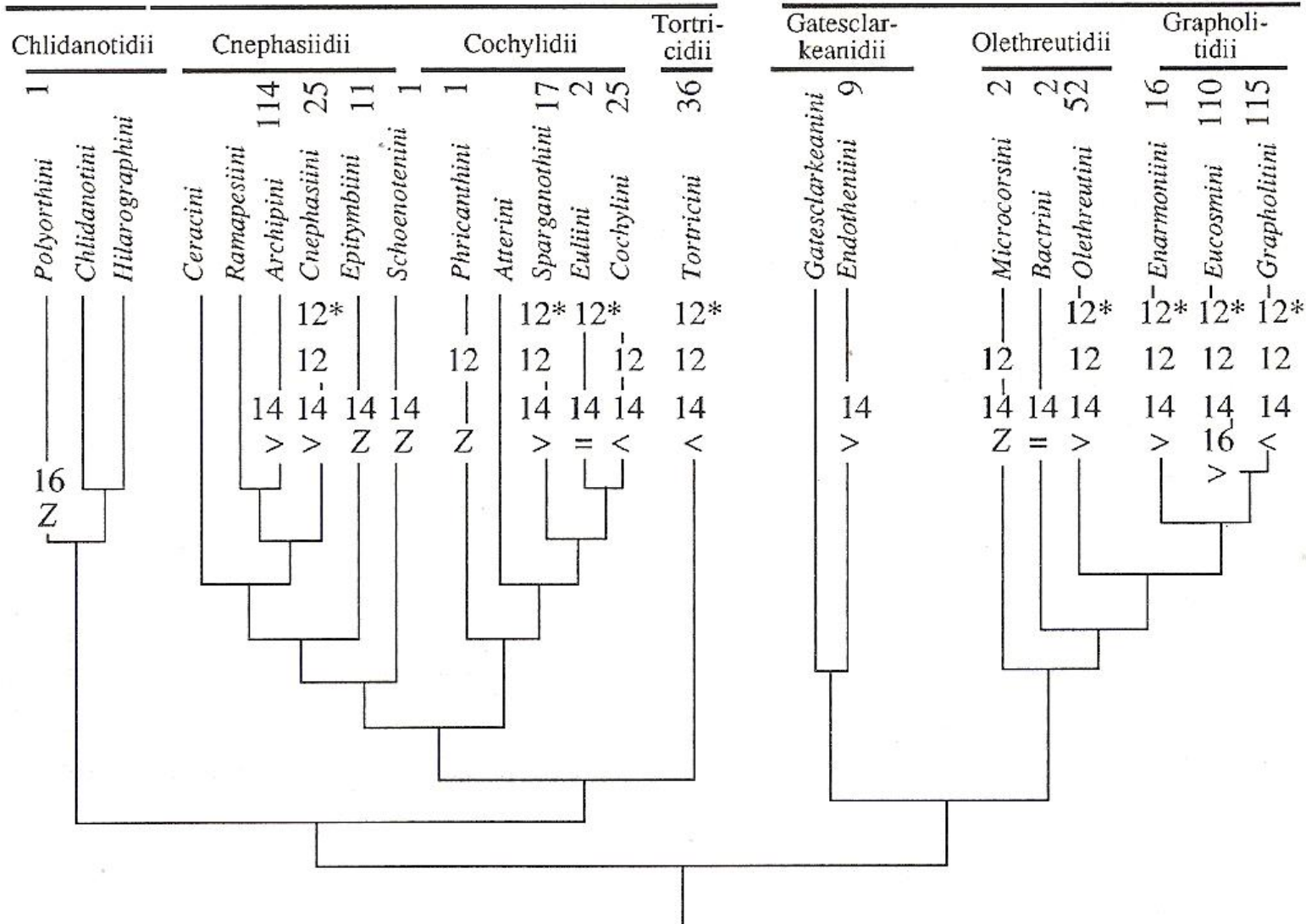
Tortricidae pheromones overlaid on phylogeny

[Number of carbons in the long carbon chain]

Chlidanotinae

Tortricinae

Olethreutinae



Classification of Tortricidae

Tortricinae

Phricanthini
Archipini
Epitymbiini
Ceracini
Sparganothini
Atteriini
Tortricini
Cnephasiini
Cochylini

Olethreutinae

Microcorsini
Olethreutini
Eucosmini
Enarmoniini
Grapholitini

Chlidanotinae

Chlidanotini
Hilarographini
Polyorthini





Tortricinae
Argyrotaenia



Tortricinae
Choristoneura



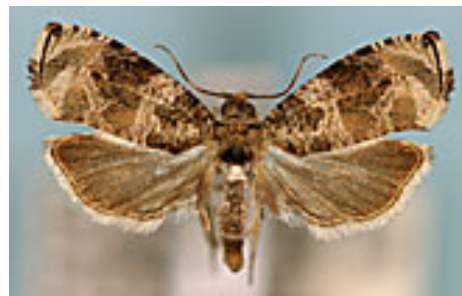
Tortricinae
Clepsis



Tortricinae
Coelostathma



Olethreutinae
Olethreutes



Olethreutinae
Olethreutes



Olethreutinae
Grapholita



Chlidanotinae
Trymalitis

Field Identification

- Three gestalts: bell, slender, humpback



Field Identification

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Field Identification

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Field Identification

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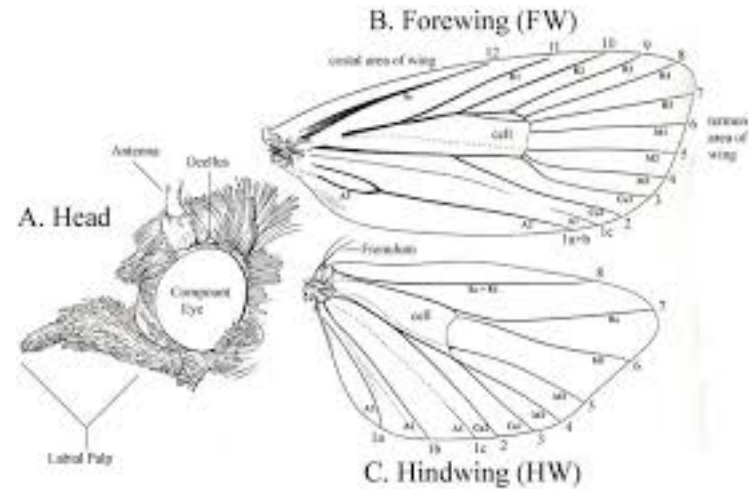


Laboratory Identification

Head rough scaled

Labial palpi moderate to short, weakly upturned or porrect

Haustellum naked



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Haustellum naked

Males of many species with
secondary scales (FW costal
fold, densely scaled legs)



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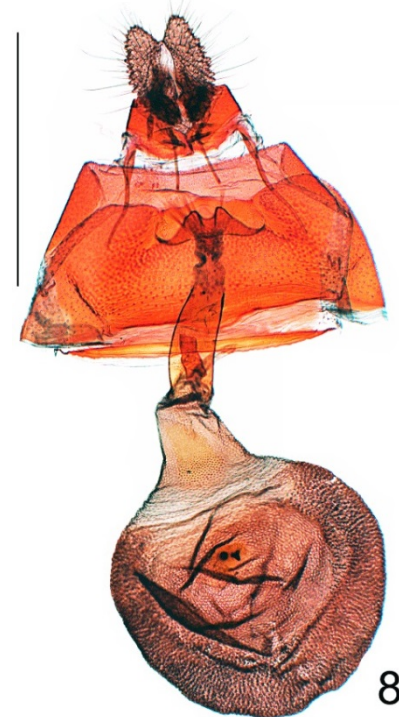
Head rough scaled

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Haustellum naked

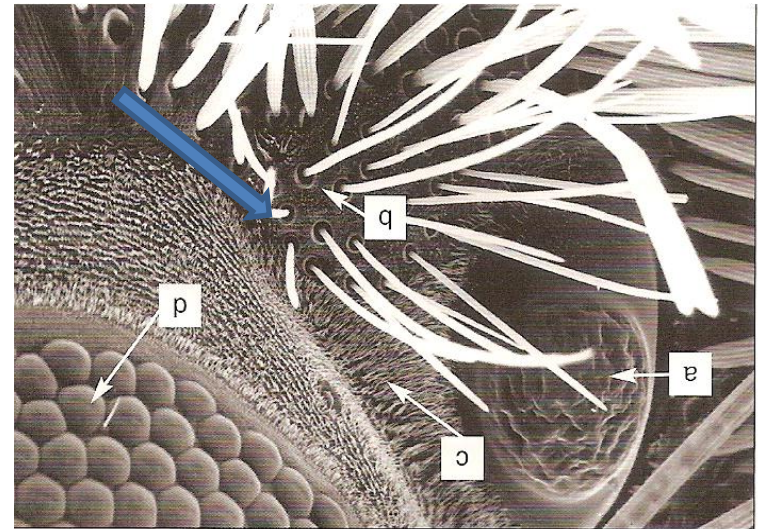
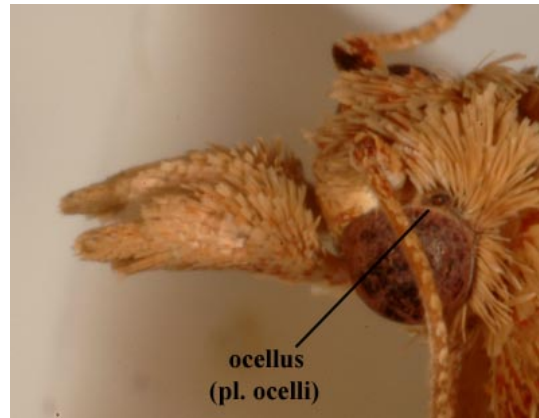
Males of many species with secondary scales (FW costal fold, densely scaled legs)

Synapomorphy: flat, slipper-shaped papillae anales in the female genitalia

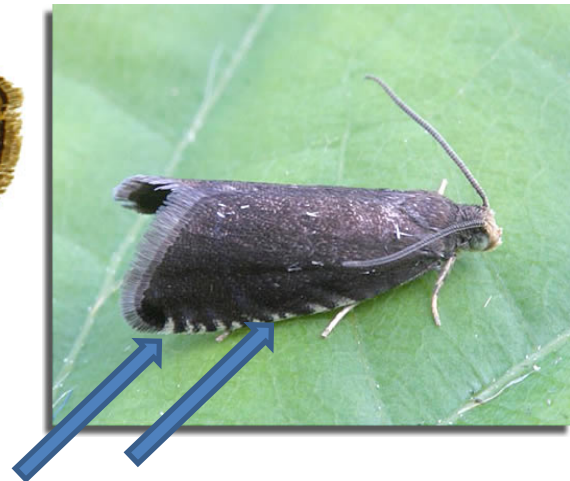
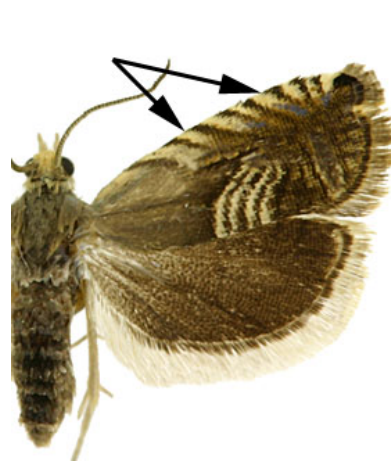


Laboratory Identification

- Chaetosemata

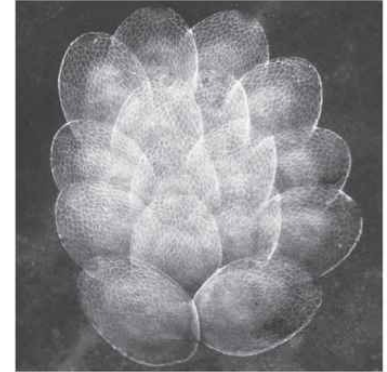


- Costal strigulae



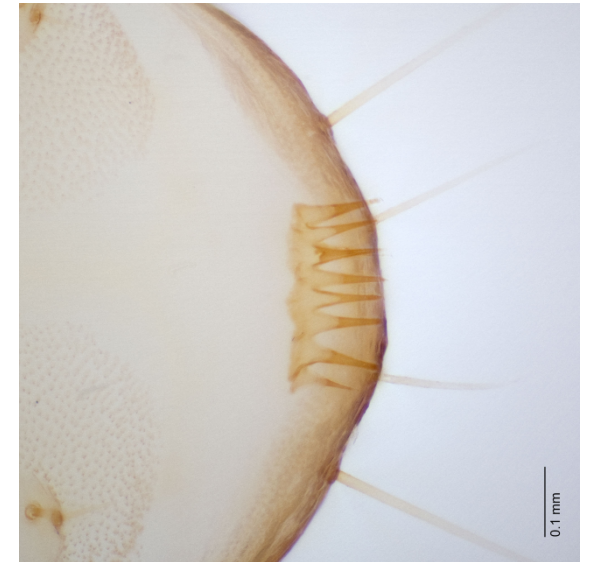
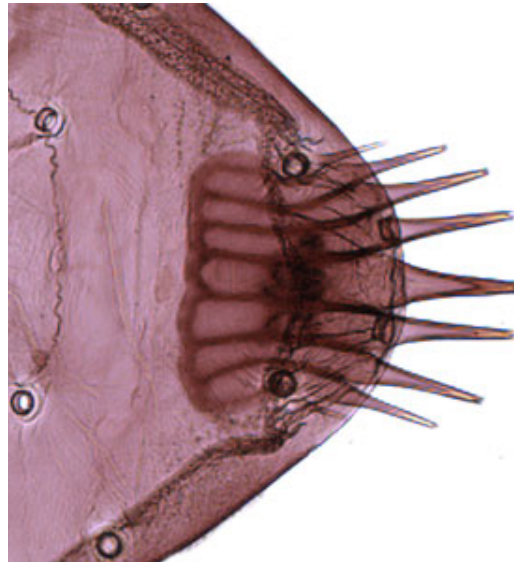
Early stages - egg

- Most Lepidoptera eggs round or spindle shaped, but Tortricidae eggs flattened and scale-like (like Limacodidae)
- Imbricate patches (Archipini, Sparganothini, Atteriini); covered with collateral secretion (Sparganothini and Atteriini); fence of scales in Atteriini



Early stages - Larva

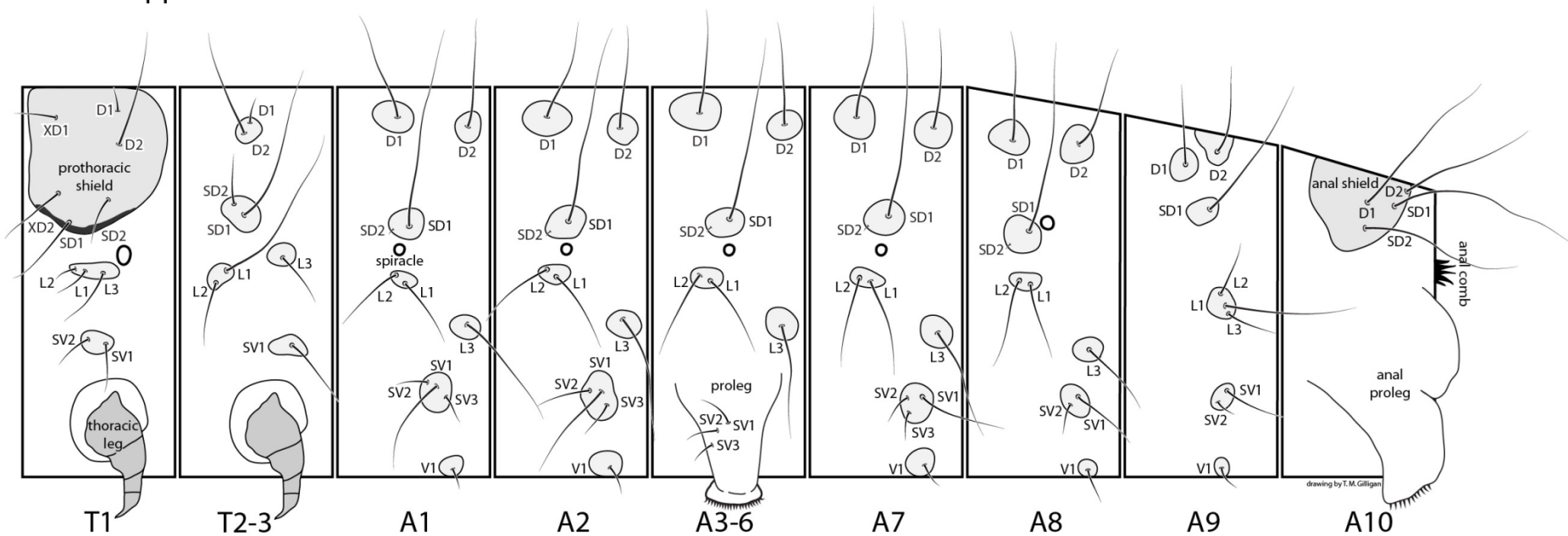
- Morphological characters
 - Anal comb (anal fork)



Early stages - Larva

- Morphological characters
 - “saddle” on A9

Amorbia spp.



Gilligan, T.M. & S.C. Passoa. 2014. *LepIntercept*, An identification resource for intercepted Lepidoptera larvae. Identification Technology Program (ITP), USDA/APHIS/PPQ/S&T, Fort Collins, CO [accessed at www.lepintercept.org].



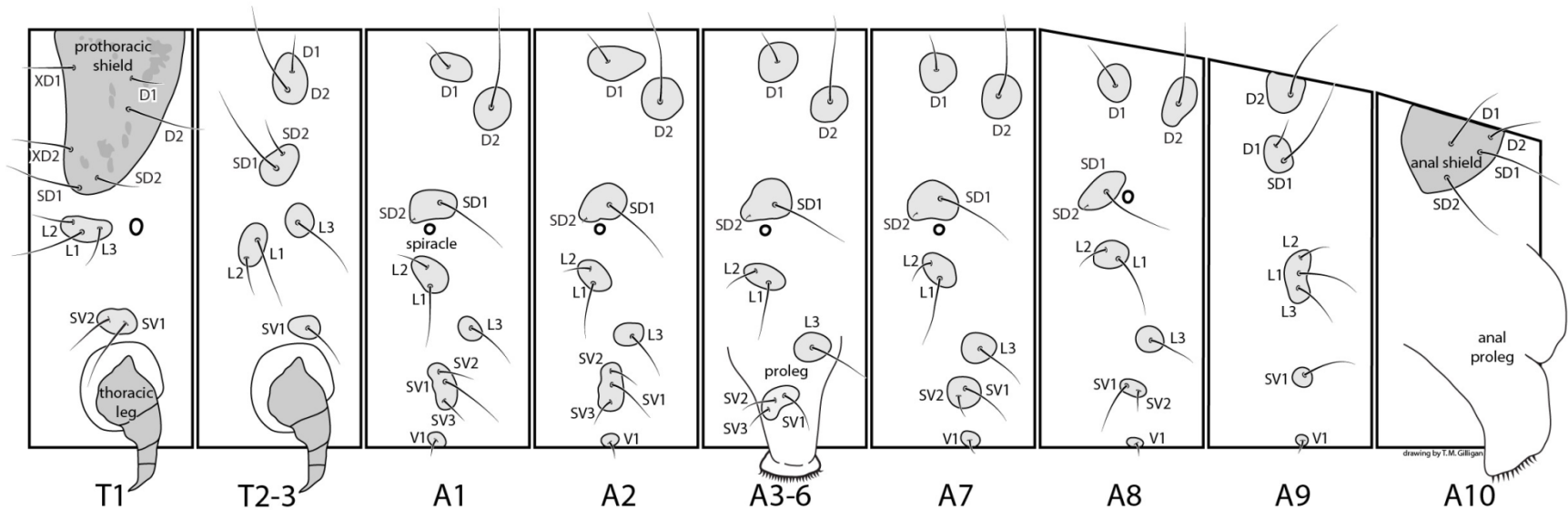
Early stages - Larva

- Morphological characters



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Cydia splendana (Hübner)



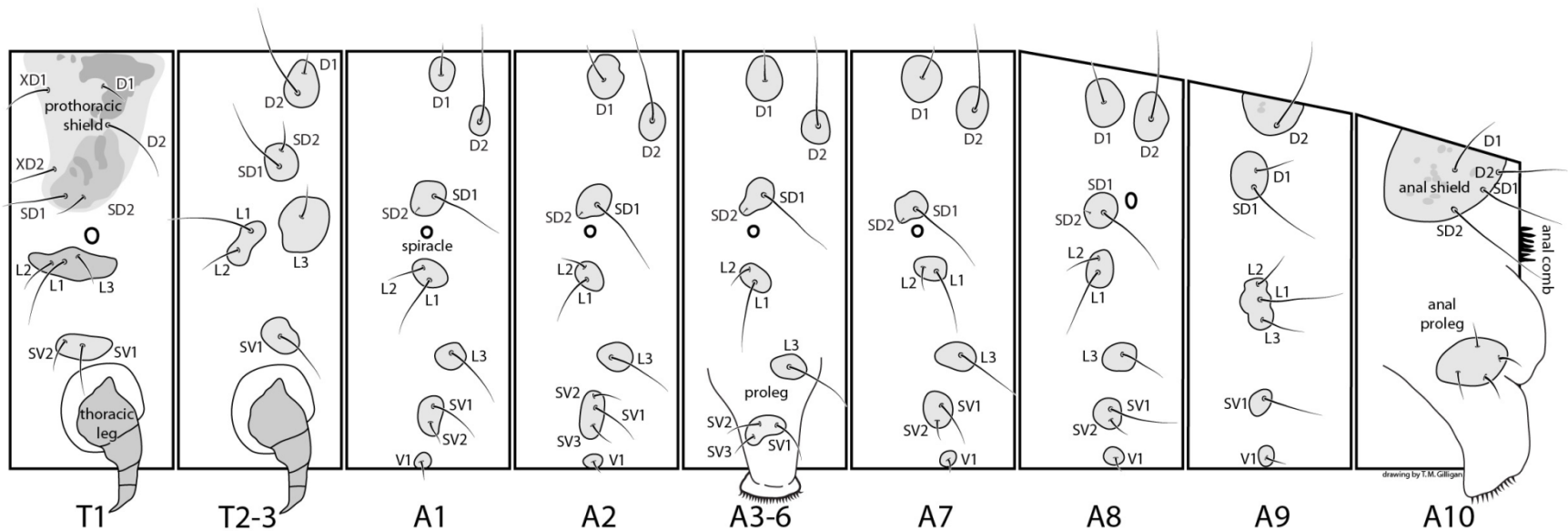
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Early stages - Larva

- Morphological characters



Thaumatotibia leucotreta (Meyrick)



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Early stages - Pupa



Early stages - Pupa



MAJOR TORTRICIDAE PESTS

Tortricinae



Archips crateagana

brown oak tortrix

Europe



Archips fuscocupreana

Apple tortrix

Asia



Archips xylosteana

apple leaf-roller

Europe

MAJOR TORTRICIDAE PESTS

Tortricinae



Epiphyas postvittana

light brown apple moth

Australia



Clepsis spectrana

cyclamen tortrix

Europe



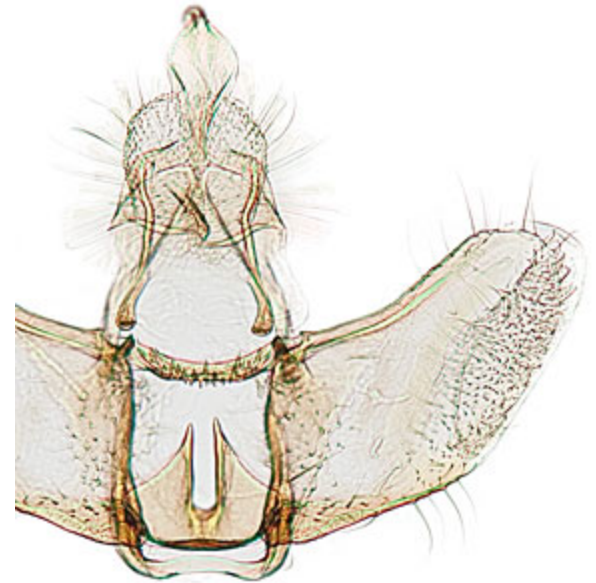
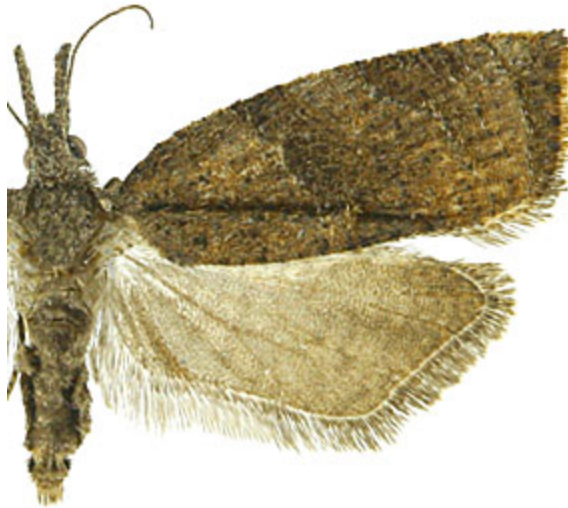
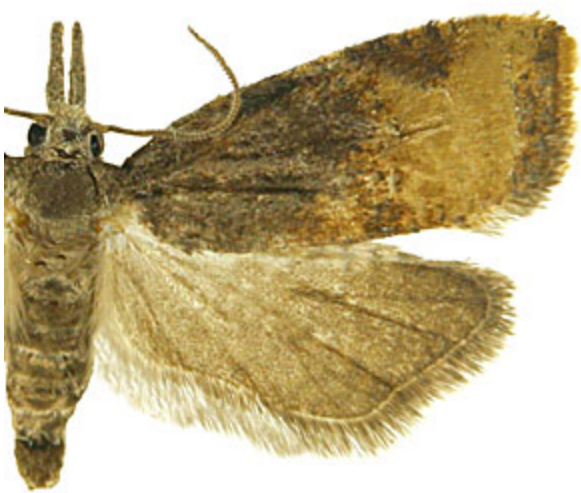
Amorbia emigratella

Mexican leaf-roller

Mexico

MAJOR TORTRICIDAE PESTS

Tortricinae



Platynota stultana

Omnivorous leaf-roller

Europe

MAJOR TORTRICIDAE PESTS

Olethreutinae



Lobesia botrana

European grape vine moth

Europe



Crocidosema aporema

bean shoot moth

Neotropics



Cryptophlebia ombrodelta

macadamia nut borer

Asia, Africa

MAJOR TORTRICIDAE PESTS

Olethreutinae



Cydia pomonella

codling moth

Europe (cosmopolitan)



Grapholita molesta

Oriental fruit moth

Asia (cosmopolitan)



Thaumatotibia leucotreta

false codling moth

Africa

Commonly encountered Tortricidae in southeastern Arizona

